Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_\_ Hour:\_\_\_\_

**Notes: Elements and Atoms**

The Elements- Objectives: To learn about the relative abundances of the elements, and to learn the names of some elements.

* Vocabulary:
* Element: A pure \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ consisting of 1 type of atom and its own \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* About \_\_\_\_\_\_\_\_ elements are known
* \_\_\_\_\_\_\_\_\_\_ exist in nature
* The term element can mean:
* A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ atom
* A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ form of an element
* A sample large enough to weigh on a balance (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ form)

Symbols for the Elements- Objective: To learn the symbols of some elements

* Vocabulary:
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ : a set of abbreviations for the chemical elements
* How Symbols Work: Usually the first \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the element’s name
* Examples:

|  |  |
| --- | --- |
| **Element** | **Symbol** |
| Carbon | **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
| Fluorine | **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
| Oxygen | **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
| Neon | **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
| Silicon | **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |

* Exception Number One: sometimes, the letters are not the first two

|  |  |
| --- | --- |
| **Element** | **Symbol** |
| Zinc | **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
| Chlorine | **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
| Platinum | **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |

* Exception Number Two: some symbols are based on the original Latin or Greek names:

|  |  |  |
| --- | --- | --- |
| **Current Name** | **Original Name** | **Symbol** |
| **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | Aurum | Au |
| **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | Plumbum | Pb |
| **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | Natrium | Na |
| **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | Ferrum | Fe |
| **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | Argentum | Ag |

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Dalton’s Atomic Theory- Objectives: to understand the law of constant composition

Vocabulary:

* The law of composition:
* A given compound always has the same composition, regardless where it comes from

Structure of the Atom- Objectives: to learn about the internal parts of an atom, and to understand Rutherford’s experiment to characterize the atom’s structure

* Vocabulary:

**Particle**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Relative Mass**: The mass of a particle when compared to an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |  |
| --- | --- | --- | --- |
| **Particle** | **Actual Mass** | **Relative Mass** | **Relative Charge** |
| \_\_\_\_\_\_\_\_\_\_\_\_\_\_ | 9.1 x 10-31 kg | 1 | -1 |
| \_\_\_\_\_\_\_\_\_\_\_\_\_\_ | 1.673 x 10-27 kg | 1836 | + 1 |
| \_\_\_\_\_\_\_\_\_\_\_\_\_\_ | 1.674 x 10-27 | 1839 | None |

**Relative Charge**: The charge of a particle when compared to an electron

**1. What does relative mean?**

**2. Which particle is the largest?**

**3. Which two particles are the closest in size?**

**4. Which particle is the smallest? How much smaller?**

|  |  |  |  |
| --- | --- | --- | --- |
| **Element** | **Protons** | **Neutrons** | **Electrons** |
| **Zn** |  |  |  |
| **Mg** |  |  |  |
| **Sr** |  |  |  |
| **Co** |  |  |  |
| **Ne** |  |  |  |
| **As** |  |  |  |

Particle Numbers and the Periodic Table- Objective: To understand how to determine the numbers of protons, neutrons, and electrons using the periodic table

* Atomic Number: The number of protons (and electrons). \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to each element
* Atomic Mass: the weight of each atom.
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_= # of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**5. What is the atomic number of lithium? 9. Complete the table:**

**6. How many protons in lithium?**

**7. How many electrons in lithium?**

**8. How many neutrons in lithium?**

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_\_ Hour:\_\_\_\_\_\_\_

Notes: Atomic Structure- Part 2

Before we begin Atomic Appearance:

1. What does PEN stand for? 2. What are the charges of PEN particles?

3. Find PEN for the following elements:

Rubidium (Rb) Nickel (Ni) Xenon (Xe)

**Part One: Atomic Notation**- Objectives: To understand how to create and read atomic notation:

Atomic Notation

* X = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the elements
* A = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Z = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Practice

* What is the atomic notation for Sodium?

Practice

* What is the atomic notation for Sodium?

Practice

* Write the atomic notation for Copper (Cu)

**Time for: Atomic Notation Practice!!**

**Part Two: What is an Isotope?** Objective: to define and determine isotopes

* Isotope: a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_of an atom that has a different number of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* There is no such thing as a different number of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_! If you change the number of protons, you change the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ you are working with!!

**Carbon Isotopes**



\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_

* Atomic mass is an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of all of the different isotopes of the atom. For example, find carbon’s atomic mass: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Carbon 12: \_\_\_\_\_\_\_\_\_\_ neutrons
* Carbon 13: \_\_\_\_\_\_\_\_\_\_ neutrons
* Carbon 14: \_\_\_\_\_\_\_\_\_\_ neutrons

How to Calculate Isotopes

* Use the atomic notation to determine the number of neutrons in the isotope:



 Neutrons: \_\_\_ \_\_\_ \_\_\_

Determine the Atomic Notation for Carbon 14

**Time for:** Isotope Practice!

**Part 3:** Drawing Atoms

* Drawing The Nucleus (1st way):
1. Draw the correct number of circles for \_\_\_\_\_\_\_\_\_\_ and put the \_\_\_\_\_\_\_\_\_\_ symbol in the circle
2. Draw the correct number of circles for \_\_\_\_\_\_\_\_\_\_ and put an \_\_\_\_\_\_\_\_\_\_ in the center of the circle
* Drawing Atoms- the BOHR MODEL
1. Draw a circle for the nucleus
2. Write the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the middle:
* Example:

 12P

 13N

* Electrons! Electrons orbit the nucleus in specific levels called \_\_\_\_\_\_\_\_\_\_. Each shell can hold a different number of \_\_\_\_\_\_\_\_\_\_
* 1st shell: \_\_\_
* 2nd shell: \_\_\_
* 3rd shell: \_\_\_
* 4th shell: \_\_\_
* 5th shell: \_\_\_
* 6th shell: \_\_\_
* Fill the shells from the inside to the outside!

**Lets try! Draw:**

a Helium atom a Lithium atom a Carbon atom